

71280.119

File E.3

## Expanded Site Inspection

## Site Safety Plan

for

LoBue #2

USEPA ID No. ILD 980 902 050

BVWST Project No. 71280.119

US EPA RECORDS CENTER REGION 5



449945

B&V Waste Science and Technology Corp.  
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Chicago, Illinois 60606  
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Prepared By: Michael A. Sanchez Date: 8/19/93

Reviewed By: Paul W. Anderson Date: 8/19/93  
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NOTICE

B&V Waste Science and Technology Corp. (BVWST) produced this site safety plan for use on the specific project indicated herein. This site safety plan is not intended or represented to be suitable for use by others on the project, or for reuse on extensions of the project, or for use on any other project. Any use without written verification or adaption by BVWST will be at the user's sole risk and without liability or legal exposure to BVWST.

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Original

B&V Waste Science and Technology Corp.  
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(BVWST HSM)Date: 19 AUG 93NOTICE

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## Contents

1.0	General Information .....	1
1.1	Site Management .....	1
1.2	Emergency Contacts .....	1
1.2.1	BVWST Emergency Contacts .....	1
1.2.2	Local Emergency Contacts .....	2
1.2.3	National Emergency Information .....	2
2.0	Site Characteristics .....	3
2.1	Facility Description and History .....	3
2.2	Storage/Disposal Methods .....	8
2.3	Physical Features and Unusual Conditions .....	8
3.0	Scope of Work .....	9
3.1	Summary of Previous Site Activities and Sampling Results .....	9
3.2	Planned Site Activities and Date .....	9
4.0	Hazard Evaluation .....	12
4.1	Chemicals of Concern .....	12
4.2	Physical Hazards .....	15
4.3	Biological or Radiation Hazards .....	16
4.4	Unusual Hazards .....	16
4.5	Drilling Hazards .....	16
4.6	Groundwater Sampling Hazards .....	17
5.0	Personal Training and Protection .....	18
5.1	Training Requirements .....	18
5.2	Medical Monitoring Requirements .....	18
5.3	Fit Test Requirements .....	18
5.4	Personal Protective Equipment .....	18
5.5	Monitoring Requirements .....	19
5.6	Site Organization and Control .....	20
5.7	Initial Procedures .....	21
5.8	Required Work Limitations .....	21
5.9	Decontamination Procedures .....	22
5.10	Disposal Procedures .....	22
5.11	Safety Equipment .....	22
5.12	Confined Space Entry Procedures .....	23
5.13	Hazardous Waste Site Personnel Activity Report .....	23
6.0	Emergency Information .....	24
6.1	Emergency Route .....	24
6.2	Contingency Plan .....	24

## Contents (Continued)

6.2.1	Pre-Emergency Planning .....	24
6.2.2	Emergency Recognition and Prevention .....	24
6.2.3	Site Security and Control .....	26
6.2.4	Evacuation Routes and Procedures .....	26
6.2.5	Emergency Decontamination .....	27
6.2.6	Emergency Medical Treatment and First Aid .....	27
6.2.7	Emergency Response Procedures .....	28
6.2.8	Critique of Response and Follow-up .....	28
7.0	Certification .....	29

## Tables

Table 1	Chemicals of Concern .....	13
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## Figures

Figure 1	Site Location Map .....	4
Figure 2	Site Sketch .....	5
Figure 3	Proposed Sample Locations .....	11
Figure 4	Emergency Hospital Route .....	25

## Attachments

Attachment A	Personal Protection .....	A-1
Attachment B	Working Environment Action Levels for Site Activities ....	B-1
Attachment C	Breathing Zone Action Levels for Site Activities .....	C-1
Attachment D	Decontamination Stations and Methods .....	D-1
Attachment E	Communication Systems .....	E-1
Attachment F	Work Practices for Temperatures in Excess of 70°F .....	F-1
Attachment G	Work Practices for Temperatures Less Than 40°F .....	G-1
Attachment H	Hazardous Waste Site Personnel Activity Report .....	H-1

## **1.0 General Information**

### **1.1 Site Management**

**Client:** U.S. Environmental Protection Agency (USEPA), Region V

**USEPA Project Officer:** Carl D. Norman (312) 886-5495

**USEPA Work Assignment Manager:** Alan Altur (312) 886-0390

**B&V Waste Science Technology Corp. (BVWST) Project Manager:**

Scott W. Anderson (312) 346-3775

**BVWST Field Team:**

Leader: Miguel A. Sanchez

Safety Coordinator: Wade A. Gregson

**Site Location:** Chicago Heights, Cook County, Illinois

**Background Information from:** USEPA, Illinois Environmental Protection Agency (IEPA)

### **1.2 Emergency Contacts**

#### **1.2.1 BVWST Emergency Contacts**

Project Manager: Scott W. Anderson

Phone: (312) 346-3775 (w)

(708) 799-5360 (h)

Director of Health and Safety (DHS): John T. "Jack" Schill

Phone: (913) 338-6595 (w)

(816) 224-2406 (h)

Medical Records: Chicago Regional Office

Barry Fischer, MD/U.S. Occupational Health, Inc.

Phone: (312) 641-1449 (w)

Worker's Compensation Administrator (WCA): Diane S. Mettenbrink

Phone: (913) 339-8561 (w)

Note: If a work-related injury or accident occurs, notify the WCA and the DHS as soon as possible after obtaining medical attention for the injured person. Notification must be made within twenty-four hours of the incident.

### ***1.2.2 Local Emergency Contacts***

Ambulance: 911

Police: 911

Fire: 911

Hospital: St. James Hospital  
1423 Chicago Road  
Chicago Heights, IL  
(708) 756-1000

Poison Control Center: 1-800-252-2022

Regional USEPA: Alan Altur, Work Assignment Manager (WAM)

Phone: (312) 886-0390

IEPA - DLPC: Tom Crause

Phone: (217) 782-6761

### ***1.2.3 National Emergency Information***

National Response Center: 1-800-424-8802

Center for Disease Control: (404) 488-4100

Chemtrec \*: 1-800-424-9300

\* Provides information to persons responding to accidents involving shipments of hazardous materials.

## **2.0 Site Characteristics**

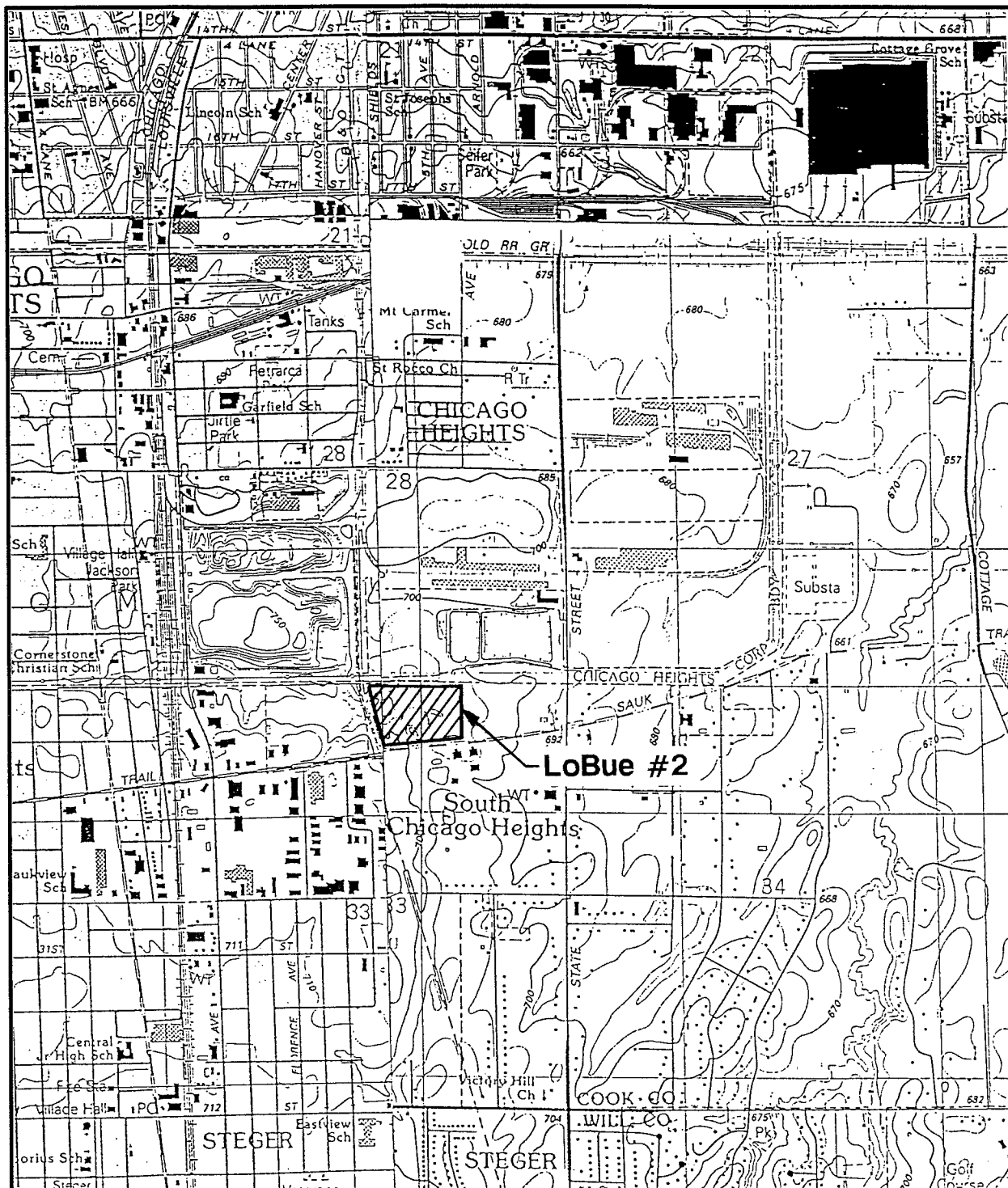
### **2.1 Facility Description and History**

LoBue #2 is a solid waste disposal facility located in southern Chicago Heights on the north side of Sauk Trail Road approximately 0.3 miles west of State Street. The 25-acre tract of land is in the northwest quarter of the northeast quarter of Section 33, Township 35 North, Range 14 East in Cook County, Illinois. Figure 1 shows the general geographic location of the site and Figure 2 shows the physical layout of the site.

The site was originally a clay mine; clay was excavated for use in making bricks. For an unknown period of time before 1975, the site was used as an illegal open dump. Wastes disposed of include household refuse, demolition debris, appliances, and oily wastes. The LoBue Excavating Company received a state permit for the operation of a solid waste disposal facility at the LoBue #2 site in December 1975. However, the site was only permitted to accept specific wastes: foundry sand, slag, cinders, soil, concrete, brick, asphalt, cardboard, and demolition material. The site was also used for the reclamation of steel scrap from foundry sand waste piles. Many violations have occurred throughout the history of the site, including the ponding of water onsite, acceptance of unpermitted wastes such as paints and solvents, inadequate cover, and leachate problems. Illinois Environmental Protection Agency (IEPA) site inspections conducted in 1979-81 documented the presence of several drums onsite. Most of the drums were empty; some drums had their contents (paint wastes) spilled onto the ground. These drums were reportedly landfilled along with other wastes.

The LoBue Excavating Company filed for bankruptcy in 1985; however, IEPA records indicate the dumping continued beyond that year. The site is inactive, but a final cover has not been constructed over the landfilled areas. The IEPA has referred the site to the State Attorney General's Office (AGO) for enforcement action. A formal complaint has not been filed by the AGO yet. Fresh tire tracks were noted during the reconnaissance visit, indicating that there is still activity occurring onsite.

No perimeter fencing restricts access to the property from outside. Perimeter ditches and large berms are located along the north and east property lines, making



Source:  
USGS 7.5" Topo. Map  
Dyer, Steger, Harvey, & Calumet City Quads

Scale:  
1:24,000

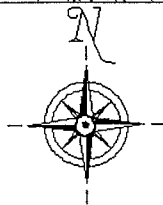
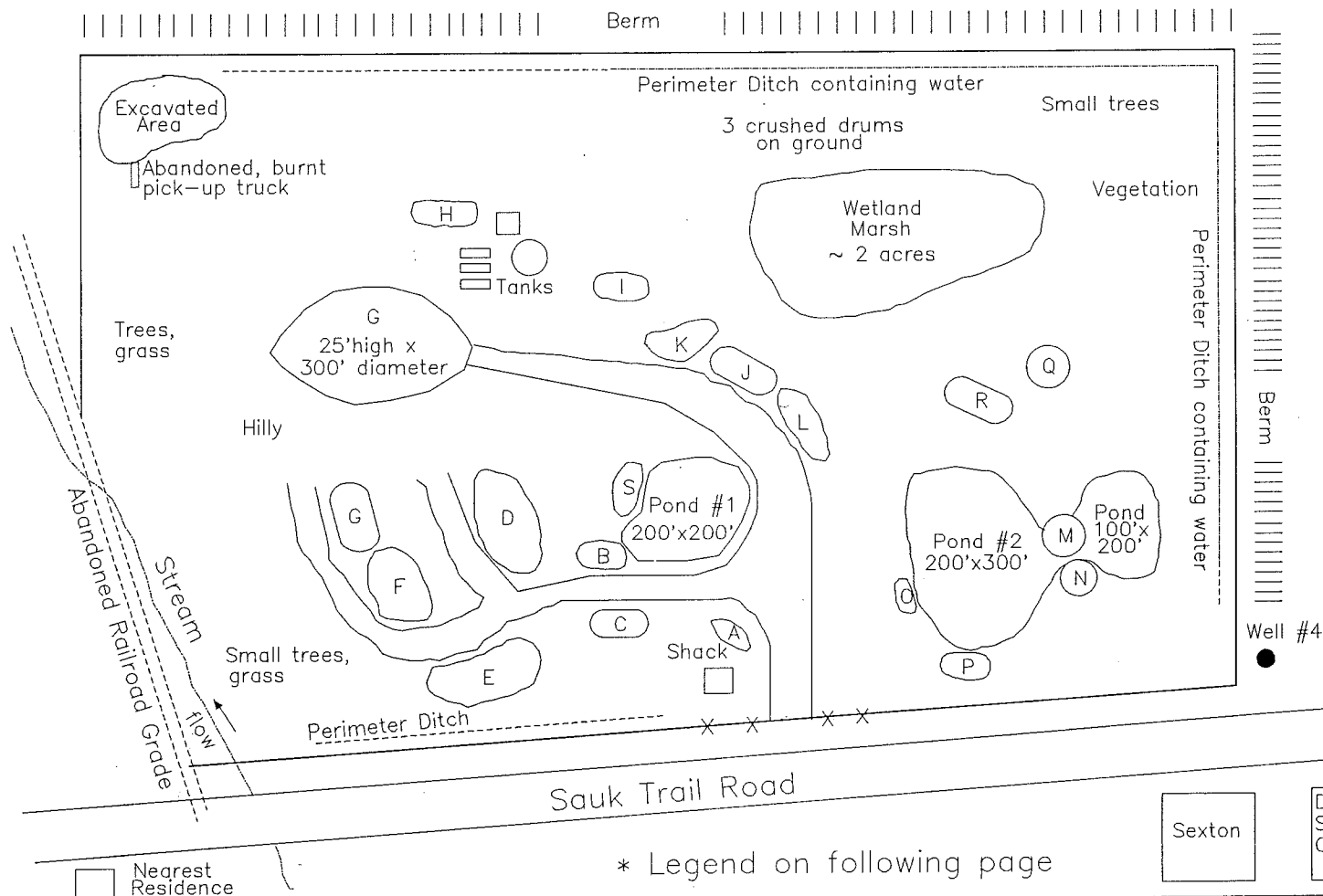


Figure 1  
Site Location Map

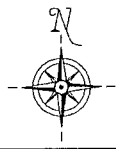
LoBue #2  
Chicago Heights, Illinois

B&V Waste Science and Technology Corp.



Source:  
Site Reconnaissance Visit, 1993

Scale:  
Not to Scale



\* Legend on following page

Figure 2  
Site Sketch

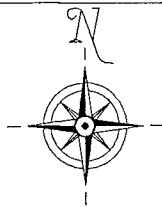
LoBue #2  
Chicago Heights, Illinois

B&V Waste Science and Technology Corp.

Waste Pile I.D.Waste Pile Contents

A	Brick, concrete, wood, demolition debris
B	Brick, concrete, wood, demolition debris scrap metal, rebar, wire cable and recently moved soil.
C	Rubber, belts, hoses, wood and scrap metal.
D	Metal sheets, wrought iron and soil.
E	Brick, wood, rock and soil.
F	Melted iron, scrap metal, gears, and soil.
G	Black ash with pebbles.
H	Black, solidified tarry substance on ground very hard, 10'x 100'.
I	Small waste sand pile(possibly foundry sand), with some wood and metal debris.
J	Scrap wrought iron.
K	Brick and concrete.
L	Soil mound.
M,N	Scrap metal waste piles in pond water.
O	Small soil mound, brick fragments, and rebar.
P	Soil mound, scrap iron sheets in the pond water.
Q	Grey soil, scrap metal debris, and concrete.
R	Slag, scrap metal and concrete.
S	Grey soil and debris.

Source:

Site Reconnaissance,  
1993Figure 2 (Continued)  
Site Sketch LegendLoBue #2  
Chicago Heights, Illinois**B&V Waste Science and Technology Corp.**

access somewhat difficult. The eastern portion of the north perimeter ditch and most of the east perimeter ditch contain standing water. A perimeter ditch is also located along the western portion of the south property line. A small stream intersects the southwest corner of the site; it flows in a northwest direction. An abandoned railroad right-of-way marks the west property line. A gate and a small amount of fencing, located at the entrance to the site along Sauk Trail Road, restricts vehicular access. Dirt roads lead from the main gate onto the property.

No buildings are onsite, and power lines run along most of the perimeter. A small guard shack in poor condition is located near the entrance to the site. Many waste piles are located onsite and consist of wrought iron, scrap metal, brick, concrete, wood, soil, and demolition debris. An inventory of the waste piles is shown on Figure 2.

Three cylindrical storage tanks and two above ground storage tanks (one appears to be a silo) are located in the northwest section of the property. The three cylindrical tanks lie on the ground surface and appear to be empty. The other two tanks contain a small amount of sludge. A black, solidified, tarry substance is located just north of the tanks. The tarry substance is very hard and covers an area approximately 10 feet x 100 feet. The tarry substance probably came from a tank that had either disintegrated or has been removed. Piping, metal, and apparent insulation material are intermixed with the solidified tar.

Several crushed, empty 55-gallon drums are strewn on the ground in the northeast section of the site. The drums are rusted and have no labels.

Two onsite ponds and an onsite marsh support wetland vegetation and wildlife. It is likely that these ponds are man-made. One pond, approximately 200 feet by 200 feet, is located in the central portion of the site. A muskrat hut is built on the pond, and waste piles are located near the edge of the pond. The other pond, approximately 200 feet by 300 feet, is located in the southeast section of the site. The pond extends to the east and covers another area approximately 100 feet by 200 feet. Large piles of scrap metal and iron are sitting in the pond. It is evident that filling has occurred along the perimeter of the pond. The marsh is located in the northeast section of the site and covers approximately two acres. The north and east perimeter ditches also contain standing water, frogs, and wetland vegetation. The stream that intersects the southwest corner of the site flows in a northwest direction; some construction debris is scattered around the stream. Site runoff generally flows to the two onsite ponds, marsh, and perimeter ditches.

Heavy vehicular traffic exists on Sauk Trail Road and several commercial developments are adjacent to the site. An open field is located to the east and an auto junk yard is west of the site.

## **2.2 Storage/Disposal Methods**

The LoBue #2 facility was used as an open dump before 1975. Wastes were dumped into open pits and buried. Landfill operations formally began in 1975 with the issuance of an IEPA operating permit. Stockpiles have also been used to store waste materials at the site, including foundry wastes, scrap metal (unpermitted), brick, wood, demolition material, bagged refuse, 55-gallon drums, tires, and other solid wastes.

## **2.3 Physical Features and Unusual Conditions**

- The property is inactive and does not have telephone access.
- The area where sampling will occur includes wetlands.
- Power lines run along most of the perimeter.
- An excavated area is located in the northwest corner of the site.

### 3.0 Scope of Work

#### 3.1 Summary of Previous Site Activities and Sampling Results

On July 2, 1985, a sample outing was conducted by a field investigative team (FIT) contractor. Five surficial soil samples (one background sample and four investigative samples) were collected to determine the waste characteristics of the soils at the LoBue #2 site. The analytical results indicated that three samples contained low levels of metals and one sample contained low levels of organic contaminants (polynuclear aromatic hydrocarbons and pesticides). Maximum compound/analyte concentrations detected follow:

Metals		Organics	
Arsenic	104 mg/kg	Phenanthrene	540 ug/kg
Beryllium	6 mg/kg	Fluoranthene	1000 ug/kg
Cadmium	5 mg/kg	Pyrene	610 ug/kg
Copper	128 mg/kg	Chrysene	360 ug/kg
Lead	177 mg/kg	Benzo(b) Fluoranthene	530 ug/kg
Mercury	0.41 mg/kg	Benzo(k) Fluoranthene	530 ug/kg
Nickel	100 mg/kg	4-4' DDE	31 ug/kg
Vanadium	47 mg/kg	4-4' DDT	49 ug/kg

#### 3.2 Planned Site Activities and Date

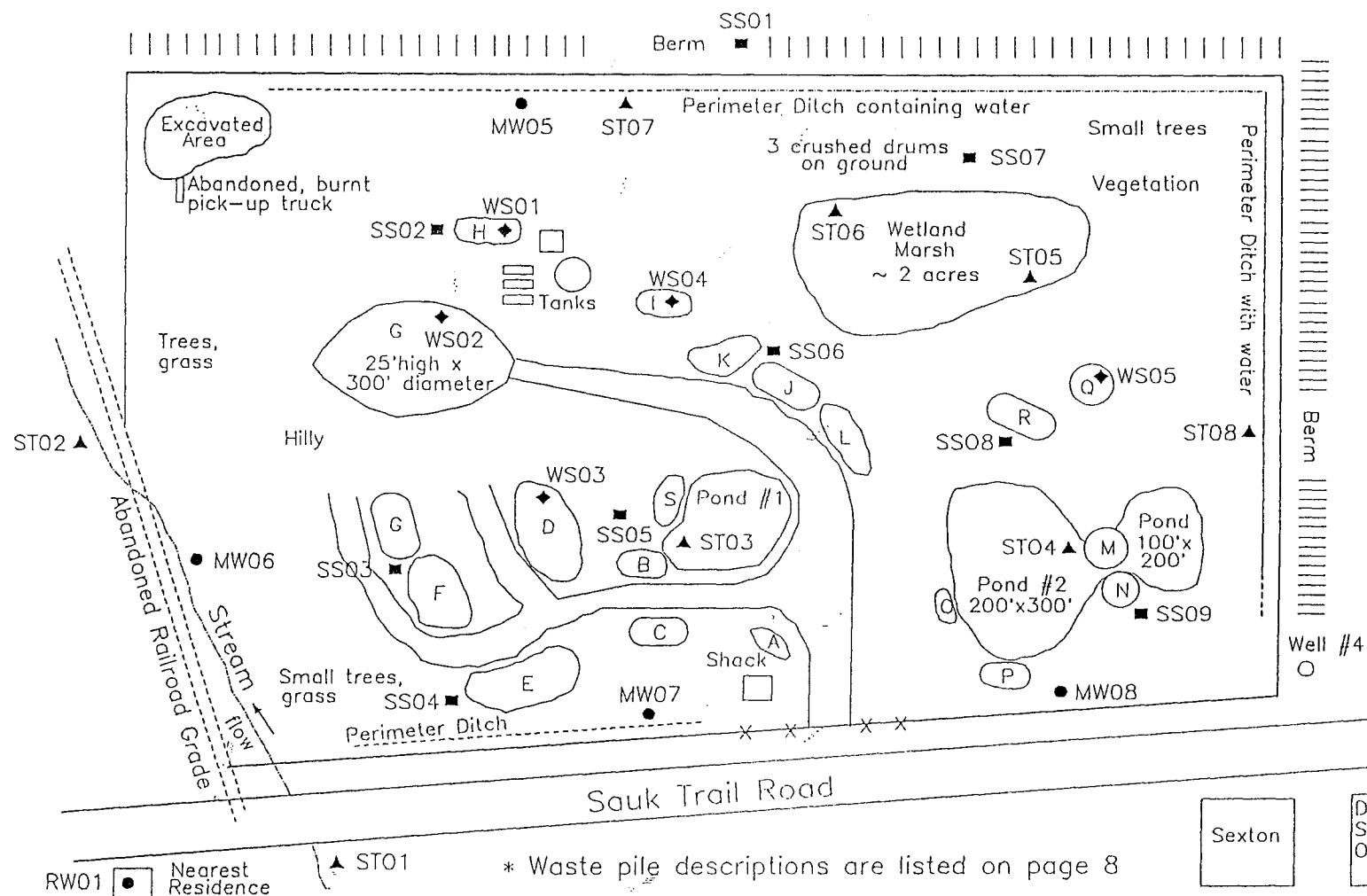
The following activities are planned for the site:

- Drilling and installation of four onsite monitoring wells.
- Development of each new monitoring well.
- Collection of one groundwater sample from each of the four monitoring wells.
- Surveying of each of the four monitoring wells by BVWST personnel.
- Performance of aquifer slug tests on each of the four monitoring wells.
- Collection of one to three residential well samples.

- Collection of eight sediment samples using decontaminated stainless steel bucket augers (manually driven).
- Collection of nine soil samples from locations adjacent to or underneath waste piles using decontaminated stainless steel bucket augers (manually driven).
- Collection of five waste samples from onsite waste piles using a decontaminated stainless steel sampling tool and bowl.

Figure 3 depicts the proposed sampling locations.

Three to four BVWST personnel will perform the field work under this site safety plan (SSP). The field effort will take 7 to 9 days to complete. The field work is expected to take place in late August 1993.



#### Legend

- MW01 Monitoring or residential well location
- SS01 Soil sample location
- ▲ ST01 Sediment sample location
- ◆ WS01 Waste source sample location

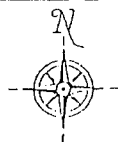


Figure 3  
Proposed Sample Locations  
LoBue #2  
Chicago Heights, Illinois

B&V Waste Science and Technology Corp.

## **4.0 Hazard Evaluation**

### **4.1 Chemicals of Concern**

Table 1 lists the chemicals of concern onsite and various data necessary to fully inform site workers of potential hazards and their particular effects. The chemicals of concern were detected in samples collected by a USEPA FIT contractor on July 2, 1985. Notation is made of the routes by which a person may be exposed. Table 1 reports one or more of the following (1) the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limits (RELs), which are time-weighted average (TWA) concentrations for up to a 10-hour workday during a 40-hour workweek; (2) the NIOSH short-term exposure limit (STEL), which is a 15-minute TWA exposure that should not be exceeded at any time during a workday; (3) the NIOSH ceiling REL, an exposure which may not be exceeded at any time; (4) the Occupational Health and Safety Administration (OSHA) permissible exposure limits (PELs), which are TWA concentrations that must not be exceeded during any 8-hour work shift of a 40-hour workweek; and (5) the American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV), which is an 8-hour TWA concentration.

The information on chemical hazards and effects on humans is gathered from the following sources:

- Handbook of Toxic and Hazardous Chemicals and Carcinogens, 2nd Edition, 1985.
- Dangerous Properties of Industrial Materials by N.I. Sax, Fifth Edition, 1979.
- Guide to Occupational Exposure Values, American Conference of Government Industrial Hygienists, 1992.
- Pocket Guide to Chemical Hazards, National Institute of Occupational Safety and Health, U.S. Department of Health and Human Services, June 1990.

Table 1 Chemicals of Concern				
Contaminant	Exposure Route	TWA Exposure Limits	IDLH	Hazard/Symptoms
Semi-Volatiles				
Benzo[b]fluoranthene (PAH) CAS # 205-99-2	Inhalation	TLV: 0.2 mg/m <sup>3</sup> Human Carcinogen		Skin irritation; increased incidence of lung cancer
Benzo[k]fluoranthene (PAH) CAS # 207-08-9	Inhalation	TLV: 0.2 mg/m <sup>3</sup> Suspected Human Carcinogen		Skin irritation; increased incidence of lung cancer
Chrysene (PAH) CAS # 218-01-9	Inhalation	TLV: 0.2 mg/m <sup>3</sup> PEL: 0.2 mg/m <sup>3</sup> Human Carcinogen		Irritant to skin, increased incidence of lung cancer
Fluoranthene (PAH) CAS # 206-44-0	Inhalation	TLV: 0.2 mg/m <sup>3</sup> Human Carcinogen		Irritant to skin, increased incidence of lung cancer
Phenanthrene (PAH) CAS # 85-01-8	Inhalation	TLV: 0.2 mg/m <sup>3</sup> Human Carcinogen		Skin irritation, increased incidence of lung cancer
Pyrene (PAH) CAS # 129-00-0	Inhalation	TLV: 0.2 mg/m <sup>3</sup> Human Carcinogen		Skin irritation, increased incidence of lung cancer
Pesticides/PCBS				
4,4'-Dichlorodiphenyl- trichloroethane (DDT) CAS # 50-29-3	Inhalation, Absorption, Ingestion, Contact	TLV: 1 mg/m <sup>3</sup> PEL: 1 mg/m <sup>3</sup> Probable Human Carcinogen	No IDLH	Abnormal sensation in tongue, lips, face, hands; tremors, apprehension, dizziness, convulsions, vomiting, irritated eyes, skin
Inorganics				
Arsenic CAS # 7440-38-2	Inhalation, Absorption, Contact, Ingestion	TLV: 0.2 mg/m <sup>3</sup> PEL: 0.01 mg/m <sup>3</sup> Human Carcinogen	100 mg/m <sup>3</sup>	Ulceration of nasal septum; dermatitis, gastro- intestinal disturbances; peripheral neuropathy; respiratory irritation, hyperpigmentation of skin
Beryllium CAS # 7440-41-7	Inhalation	TLV: 0.002 mg/m <sup>3</sup> PEL: 0.002 mg/m <sup>3</sup> Probable Human Carcinogen	10 mg/m <sup>3</sup>	Respiratory symptoms, weakness, fatigue; weight loss
Cadmium CAS # 7440-43-9	Inhalation, Ingestion	TLV: 0.05 mg/m <sup>3</sup> PEL: 0.1 mg/m <sup>3</sup> Probable Human Carcinogen	50 mg/m <sup>3</sup>	Pulmonary edema, dyspnea, cough, chest tightness, substernal pain; headache; chills, muscle aches; nausea, vomiting, diarrhea, mild anemia

Table 1 Chemicals of Concern (Continued)				
Contaminant	Exposure Route	TWA Exposure Limits	IDLH	Hazard/Symptoms
Copper CAS # 7440-50-8	Inhalation, Ingestion, Skin/Eye Contact	TLV: 1 mg/m <sup>3</sup> PEL: 1 mg/m <sup>3</sup> Probable Human Carcinogen	No IDLH	Pharynx and mucous membrane irritant, nasas perforation, eye irritant, metallic taste
Lead CAS # 7439-92-1	Inhalation, Ingestion, Skin/Eye Contact	TLV: 0.15 mg/m <sup>3</sup> PEL: 0.05 mg/m <sup>3</sup>	700 mg/m <sup>3</sup>	Weakness, lassitude, insomnia, facial pallor, anorexia, low-weight, constipation, abdominal pain, anemia, wrist and ankle paralysis
Nickel CAS # 7440-02-0	Inhalation, Ingestion, Skin/Eye Contact	TLV: 1 mg/m <sup>3</sup> PEL: 1 mg/m <sup>3</sup> Carcinogen	No IDLH	Headache, nausea, vomiting epigastric pain, substernal pain, cough, cyanosis, weakness, pneumonitis, delirium, abnormally deep and rapid breathing
Vanadium Pentoxide CAS # 1314-62-1	Inhalation, Contact	TLV: 0.05 mg/m <sup>3</sup> PEL: 0.05 mg/m <sup>3</sup>	70 mg/m <sup>3</sup>	Irritated eyes; green tongue, metallic taste; irritated throat, cough; fine rales, wheeze, bronchitis, dyspnea; eczema

## 4.2 Physical Hazards

Physical hazards include potential injuries from lifting objects greater than one-third of body weight, using sharp or edged implements, and slips, trips, and falls. These hazards will be minimized by raising objects with the legs rather than the back, taking care to avoid cut or stab wounds when using sharp or edged implements (scissors, knives, tape dispensers), and maintaining safe footing. Other physical hazards associated with the field activities are described below.

Soil and sediment samples will be collected using a 3 inch stainless steel bucket auger with a "tee" handle. The bucket auger will be driven into the ground by turning the handle in a clockwise direction by hand. Care will be taken to avoid muscle strain when driving the bucket auger into the ground.

Monitoring wells will be purged and sampled using stainless steel bailers. Care will also be taken to avoid muscle strain during these activities.

A potential exists for hazardous vapors to emanate from the sample hole. The breathing zone of workers near the sample hole will be monitored with a flame ionization detector (FID), such as an OVA, or photoionization detector (PID), such as an HNu, during work. Sampling is anticipated to be performed in Level D personal protective equipment (PPE) with the possibility of upgrading to Level C if PID or FID readings in the worker breathing zone exceed background (up to 5 ppm). All sampling activity at the site will be initiated with the personnel attired in Level D. The degree of protection and items required in Level D are described in Attachment A. Should any monitoring result or other observation indicate the potential inadequacy of Level D (as specified in Attachment C), all team members will immediately withdraw to the designated rally point and reassess the site conditions.

A potential exists for hazardous vapors to emanate from soil samples. Before logging the sample, a worker standing upwind of the sample will screen it with the FID or PID.

An excavated area is located in the northwest corner of the site. Samplers should be careful when walking around this area.

The weather may lead to conditions conducive to heat or cold stress. Recommended practices for work in extreme temperatures are described in Attachments F and G.

### **4.3 Biological or Radiation Hazards**

The inadvertent disposal or use of radioactive substances at a site before general recognition of their pollution potential remains a possibility, especially for sites dating back to before 1950. Because reliable information can be obtained only by a survey with a radiation counter, the team will make such a survey of the site immediately after their arrival. If any radiation is detected above background, the sampling team will leave the site and contact the WAM, PM, and DHS.

No biological hazards are expected.

### **4.4. Unusual Hazards**

The area where sampling will occur includes wetlands; samplers should be prepared to sample in deep water. Although the sediment samples are to be collected in shallow areas with little or no current, a harness and rope will be available when collecting these samples.

### **4.5 Drilling Hazards**

Potential drilling hazards include fire and explosion; personal injury from falling objects or machinery; and slips, trips, or falls.

Working around heavy equipment presents hazards to site personnel in the form of rotating parts, pinch points, gears, high pressure hydraulic lines, high noise levels, and exhaust fumes. Only personnel associated with work activities will be near equipment. All other personnel will be required to stay a minimum of 30 feet from the drill rig. Broken or separated parts of the drill rig falling from overhead or flying free are potential hazards to persons working on and around active drill rigs. Safety glasses and hard hats are to be properly worn at all times while working at or near to drilling equipment. Hearing protection will be used when the drill rig is in operation.

A potential exists for electrocution by contact with overhead or underground electric utility lines. Fire or explosion, as well as disruption of public service could result if the drill bit ruptures a buried gas line, water main, sewer or petroleum pipeline. Therefore, all boring locations will be located at least twenty feet outside the outer edge of overhead utility lines and other surface obstructions. Also, before commencing drilling, all underground utility corridors of the area will be delineated by authorized utility representatives. Onsite underground obstructions, such as drums, tanks, vaults, vessels, etc., will be located and avoided through consultation

with owner/operators. Fire, explosion or toxic exposure from released gases is a possibility if the drill bit enters the covered cell of a landfill. The limits of landfilled areas will be determined and every effort made to locate borings outside the cell limits. When uncertainty exists, workers will be in the appropriate personal protective equipment (PPE) level to maximize protection. Drilling activities will be placed to minimize risk of interference from vehicular or railroad traffic.

A potential exists for hazardous vapors to emanate from the borehole during drilling. The breathing zone of workers near the borehole will be monitored with an FID or a PID during drilling work. Drilling work is anticipated to be performed in Level D PPE with the possibility of upgrading to Level C if PID or FID readings in the worker breathing zone occur in concentrations above background (up to 5 ppm).

#### **4.6. Groundwater Sampling Hazards**

A potential for exposure to concentrations of vapors accumulated beneath the cap of a monitoring well exists during groundwater sampling activities. The worker opening the well will stand upwind with his face away from the cap area and then inspect the well mouth with a FID or PID to determine the presence of vapors before performing any groundwater sampling activities.

## **5.0 Personnel Training and Protection**

### **5.1 Training Requirements**

All personnel assigned to actively engage in hazardous waste operations at this site must present to the site safety coordinator (SSC) certification of successful completion, within the 12 months before the beginning date of site work, of a hazardous waste site investigation training or refresher course. The training must comply with applicable OSHA regulations found in 29 CFR 1910.120 et. seq. Presentation of the certification must occur before the worker departs for the site. All workers assigned to hazardous waste investigation will be currently certified in first aid and cardiopulmonary resuscitation. BVWST policy requires that the SSC complete an 8-hour supervisor training course and have at least six days of work experience at or above the planned level of protection before site field work begins.

### **5.2 Medical Monitoring Requirements**

All personnel assigned to the hazardous waste investigation of this site must present to the SSC certification of completion, within the 12 months before the date site field work begins, of a comprehensive medical monitoring examination, which must comply with OSHA regulations in 29 CFR 1910.120 et seq. The certification must be signed by a medical doctor and must indicate (1) any work limitations placed on the individual and (2) the individual is capable of working while wearing respiratory protection equipment. Presentation of the certification must occur before the worker departs for the site.

### **5.3 Fit Test Requirements**

All workers entering the exclusion or contamination reduction zones at a site where use of a full-face negative pressure respirator is necessary must have successfully passed a qualitative respirator fit test in accordance with OSHA 29 CFR 1910.134 within the preceding 12 months.

### **5.4 Personal Protective Equipment**

All sampling activity at the site will be initiated with the personnel attired in Level D. Attachment A describes the degree of protection and items required in Level D. If a monitoring result or other observation indicates the potential

inadequacy of Level D, all team members will immediately withdraw to the designated rally point and reassess the site conditions.

## **5.5 Monitoring Requirements**

Immediately upon initial entry by the sampling team, monitoring of the site will be carried out with the following equipment:

- A device capable of detecting the presence of organic vapors (a PID or a FID).
- A device capable of detecting radioactivity.
- A device capable of detecting hydrogen cyanide gas.
- A device capable of detecting the amount of oxygen in the air and any explosion/fire danger.

Each of these devices will be calibrated immediately before initial use and recalibrated at the beginning of each successive day of use.

The SSC will direct and supervise perimeter and general site monitoring, upwind and downwind, to establish background levels. The SSC will direct the subsequent frequency of monitoring based on the value of the initial readings and the limits described in Attachment B.

The potential exists for hazardous vapors or explosive gases to emanate from boreholes during the drilling activities. The top of the borehole and breathing zone for workers near the borehole will be monitored with a PID or FID, and a O<sub>2</sub>/LEL meter during the drilling work.

The decision by the SSC to upgrade/downgrade the level of personal protective equipment will be based on concentrations detected in the breathing zone of workers and the indicated limits in Attachment C.

Operation, maintenance, and calibration in accordance with the manufacturers requirements as described in the appropriate equipment manual of each instrument used onsite is the responsibility of the SSC.

If the release of contaminants could negatively impact the health and safety of inhabitants of the surrounding areas, the SSC will contact the USEPA WAM and local emergency response organization.

## 5.6 Site Organization and Control

No perimeter fencing restricts access to the property from outside. Perimeter ditches and large berms are located along the north and east property lines, making access somewhat difficult. The eastern portion of the north perimeter ditch and most of the east perimeter ditch contain standing water. A perimeter ditch is also located along the western portion of the south property line. A small stream and an abandoned railroad right-of-way are located along the west property line, making access from that direction also somewhat difficult. A gate and a small amount of fencing is located at the entrance to the site, along Sauk Trail Road, to restrict vehicular access.

The available information supports the use of Level D PPE during the activities onsite. Three general work zones will be established regardless of the level of protection: an exclusion zone, a contamination reduction zone, and a support zone. An exclusion zone will be designated around each boring drilled for monitoring well installation, around waste piles, and around each sample collection point. The exclusion zone boundary for boreholes will be 20 feet outward from the borehole or the site property line, whichever is least. The exclusion zone boundary for waste piles will be four feet outward from each waste pile. For soil, sediment, and surface water sample collection points, the exclusion zone boundary will be four feet outward from each sample collection point. The contamination reduction zone will consist of the area between the exclusion zones and the support zone. Decontamination of personnel and equipment will occur in the contamination reduction zone. The support zone will consist of the dirt road leading into the property, where the vehicles will be parked when onsite. Personnel and equipment leaving an exclusion zone must be decontaminated according to the procedures described in Section 5.9 before entering the support zone. Chemical protective PPE is not required in the support zone. Entry into an exclusion zone or contamination reduction zone will be limited to workers with certified training and medical monitoring in accordance with sections 5.1, 5.2, and 5.3.

Use of a buddy system is mandatory for entry into an exclusion zone. At least two people will work as a team, each looking out for the other. Each buddy will observe the partner for stress, check the partner's protective clothing, notify the support zone in the event of an emergency, and provide assistance, if needed.

Successful communication between field workers is essential. Attachment E shows the two communication systems set up for this purpose. The SSC will

determine which system will be used onsite. The SSC will instruct all field personnel to stand upwind of the work area whenever possible.

## **5.7 Initial Procedures**

- Coordinate field activities with the drilling subcontractor, USEPA, IEPA, and the property owners.
- Locate nearest available accessible telephone and a backup.
- Drive the selected route from site to nearest hospital.
- Confirm and post the emergency telephone numbers.
- Post the OSHA job safety and health protection poster.
- Hold safety briefing for all workers.
- Designate the vehicle to be used for emergencies.
- Determine prevailing wind direction.
- Perform initial site survey with the planned monitoring equipment.
- Establish the work zones.

## **5.8 Required Work Limitations**

- Work is allowed only during daylight hours.
- All personnel will wear their TLD badges while onsite and traveling to and from the site.
- Work shall cease during any storm event exhibiting lightning and personnel shall enter vehicles.
- Air monitoring will occur as specified in plan.
- No worker may enter site with facial hair that would interfere with proper fit of respirator.
- No worker may wear contact lenses while onsite.
- Horse play is strictly prohibited while onsite.
- While working in EZ or CRZ, the following rules apply:
  - No eating, drinking, or use of tobacco or cosmetics in this zone.
  - No matches or lighters in this zone.
  - Wear level of protection specified in SSP.
- While working in the EZ, the following rules apply:
  - Check in with SSC upon entering; check out with SSC upon exiting.
  - Implement the communications system.
  - All workers remain within sight of one another.

- Upgrade to level B is not authorized without written approval by the DHS.

## **5.9 Decontamination Procedures**

For personnel: A decontamination station will be established. Gross contamination will be washed off PPE and monitoring equipment before leaving the site. Used PPE will be placed in double plastic bags and disposed of as municipal solid waste. Refer to Attachment D for the step-by-step procedure for personnel decontamination planned for the site. Decontamination will be conducted in Level D protection.

For sampling equipment, decontaminate using the following procedure:

- (1) Wash in a solution of biodegradable detergent, scrubbing with brush to remove adhering material, if necessary.
- (2) Triple rinse with tap water.
- (3) Triple rinse in deionized water.
- (4) Wrap all decontaminated equipment in foil.

For monitoring equipment, decontaminate using the following procedure:

- (1) Prevent contact with contaminated materials as much as possible.
- (2) Wipe with a cloth dampened in a biodegradable detergent solution.

## **5.10 Disposal Procedures**

The disposal of decontamination wastes will follow procedures mandated by USEPA Region V.

Decontamination Wastes: Investigation-derived waste (IDW) must be disposed of onsite unless doing so will increase hazards. If IDW must be removed from a site, a subcontractor will have to be hired to provide the transportation, testing, and disposal services in accordance with Resource Conservation and Recovery Act guidelines and under IEPA supervision. Spent decontamination soap/rinse solutions will be disposed of onsite at the sample collection points.

Used PPE: Used protective clothing will be decontaminated onsite, secured in double plastic bags, and disposed as municipal solid waste.

## **5.11 Safety Equipment**

- Fire extinguishers, ten-pound ABC (one per vehicle).
- Eye-wash kits (15-minute capacity).

- First aid kits (one per vehicle).
- Blanket, one for each two workers.

### **5.12 Confined Space Entry Procedures**

No confined space entries will occur during the activities at this site.

### **5.13 Hazardous Waste Site Personnel Activity Report**

A hazardous waste site personnel activity report (Attachment H) will be filled out by the field team leader as a part of follow-up activities. The completed report will be sent to the BVWST Director of Health and Safety (DHS).

## **6.0 Emergency Information**

### **6.1 Emergency Route**

St. James Hospital is located at 1423 Chicago Road, in Chicago Heights, Illinois. From the site take Sauk Trail Road west (right) to Chicago Road. Turn right and head north on Chicago Road. Proceed approximately 2 miles to hospital. The hospital will be on the west (right) side of Chicago Road.

The location of and the described route to the hospital is shown on Figure 4.

### **6.2 Contingency Plan**

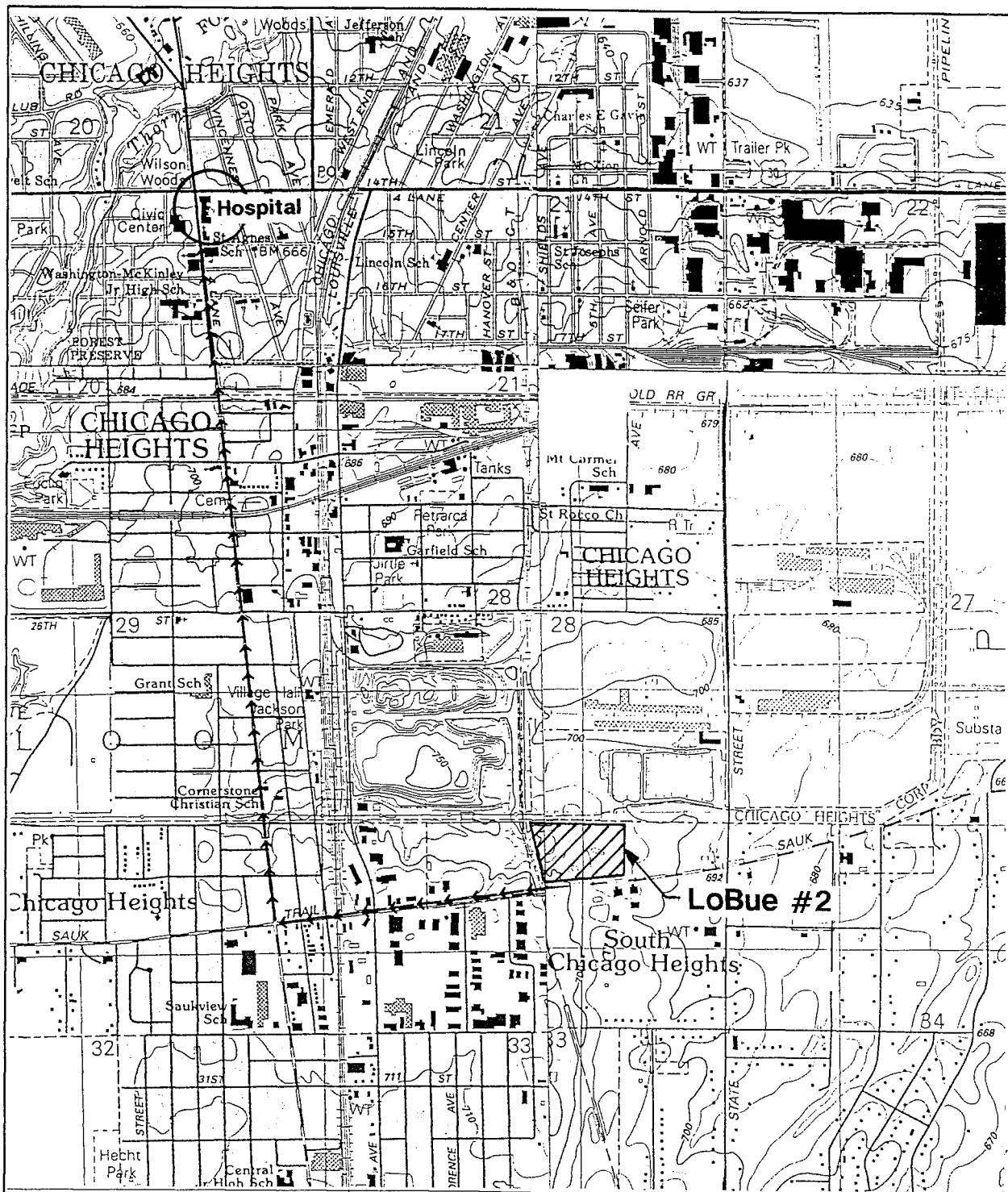
#### ***6.2.1 Pre-Emergency Planning***

The SSC will also act as emergency coordinator and be responsible for initiating appropriate emergency procedures when required during site work. In the event of a work related injury, notification of the fact will be given to the SSC, the field team leader (FTL), the project manager (PM), and the DHS. The emergency coordinator is responsible for the following actions:

- Establishing work zones and escape route.
- Direction of onsite personnel to respond to incipient fires and minor spills.
- Notifying the emergency response team for the locality.
- Assessing the emergency.
- Administering or directing first aid.
- Maintaining safety equipment.
- Posting emergency telephone numbers and map showing route to hospital.

#### ***6.2.2 Emergency Recognition and Prevention***

All BVWST workers will bring to the attention of the SSC or FTL any unsafe condition, practice, or circumstance associated with or resulting from the field investigation. In cases of immediate hazard to the BVWST workers or the public, any employee on the scene will take all reasonable and safe steps to eliminate or neutralize the hazard. Subsequent consultation with the SSC, FTL, PM, and DHS will occur at the first opportunity. For such circumstances, the SSC will take those actions necessary to ensure the investigation can be safely completed. Such actions



Source:  
USGS 7.5" Topo. Map  
Dyer, Steger, Harvey, & Calumet City Quads

Scale:  
1:24,000

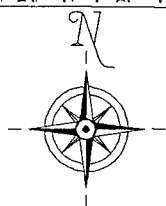


Figure 4  
Emergency Hospital Route

LoBue #2  
Chicago Heights, Illinois

B&V Waste Science and Technology Corp.

could be changes in procedure, consultation with appropriate experts, or obtaining a specialist. In instances where the hazard is not an immediate danger to the field team, the SSC may consult the DHS source regarding appropriate corrective measures.

If any team member is overcome, incapacitated, or traumatically injured onsite, the other team members will immediately call for assistance, don appropriate protective equipment, and make reasonable efforts to aid the affected person. At least one person will remain outside the problem area until help arrives. If removal of the affected person from the site is necessary, the buddy shall accompany him/her unless specifically forbidden by medical or police authority. If prudent, personnel decontamination will occur to the extent possible, but not at the expense of time needed to treat the affected person.

If it is known or suspected that the problem is due to chemical exposure, then all team members similarly exposed will proceed immediately, together, to the nearest appropriate medical facility. If personal contamination has occurred, all persons involved will make every reasonable effort to decontaminate themselves.

#### ***6.2.3 Site Security and Control***

The SSC will be in charge of site security and control in the event of an emergency (i.e., fire, spill, etc.). If an emergency situation should arise, appropriate steps will be taken to insure that exposure to the hazard is minimized and people are kept offsite. Because the site is not fenced, onlookers could enter the site anywhere along the south property line. Physical features make entrance to the site from the north, east, and west property lines difficult. Therefore, BVWST personnel will visually control access onto the property from the south by patrolling this area. The SSC will notify the property owner and the appropriate emergency response authorities of the emergency situation. When the owner or higher authority arrive at the scene, control of the site will be surrendered to them.

#### ***6.2.4 Evacuation Routes and Procedures***

Evacuation of the LoBue #2 property will be to the south. Team members will rally outside of the main entrance to the site on the side of Sauk Trail Road and await instructions from the SSC. The SSC will designate an evacuation route from each sampling area that will move workers away from the developed hazard in a safe, efficient manner and permit effective access for fire/emergency vehicles during an

emergency. From the rally point, the team will proceed to a location that is upwind and at a safe distance from all areas of activity. The SSC is responsible for determining if all personnel are present at the rally point. In the event of missing personnel, emergency response organizations will be notified immediately of the need for search and rescue. Personnel will remain at that area until an authorized individual provides further instructions.

#### ***6.2.5 Emergency Decontamination***

In addition to routine decontamination procedures, emergency decontamination procedures will be established. In an emergency, the primary concern is to prevent the loss of life or severe injury to site personnel. If immediate medical treatment is required to save a life, limited decontamination will be performed or the person will be wrapped in a blanket. If a worker has been contaminated with an extremely toxic or corrosive material that could cause severe injury or loss of life, decontamination will be performed immediately. If an emergency due to heat-related illness develops, protective clothing will be removed from the victim as soon as possible to reduce the heat stress. During an emergency, provisions will also be made for protecting medical personnel and disposing of contaminated clothing and equipment.

#### ***6.2.6 Emergency Medical Treatment and First Aid***

All BVWST personnel conducting hazardous waste operations at the site will have successfully completed Red Cross sponsored courses in adult first aid and cardiopulmonary resuscitation. Before the start of work, the SSC will confirm the availability of medical facilities, ambulance service, and emergency personnel.

Onsite first aid equipment will consist of a 15-minute eye wash, location to be determined after establishing the command post, exclusion, and contamination reduction zones; a first-aid kit to be carried in each of the vehicles associated with the sampling event; a fire extinguisher located in each vehicle; and a wool blanket for each two workers. An approved SSP, including a map to the hospital and emergency telephone numbers for the local ambulance, hospital, poison control center, fire, and police, will be kept in each vehicle.

If the SSC determines that a situation occurs which could threaten human health or the environment outside the facility, he will immediately notify the USEPA and appropriate local authorities.

All personnel responding to an emergency will maintain direct contact with the emergency coordinator at all times. Hand signals will be utilized where radios are impractical or unsafe. Attachment F lists the hand signals most often used. The location of the nearest telephone will be determined; sampling team personnel will be notified of the location.

#### ***6.2.7 Emergency Response Procedures***

The field team will be responsible for responding to minor emergencies such as incipient fires and minor first-aid problems. In the event of fire, spill, or other emergencies that cannot be controlled by onsite personnel, all site personnel will evacuate to the rally point. Site personnel will wait in the designated zone for further instructions from the SSC and/or emergency response personnel.

#### ***6.2.8 Critique of Response and Follow-up***

A follow-up meeting will be held after any emergency situation to assess the actions taken. The meeting will be attended by the SSC and other individuals as appropriate. A record of the meeting will be kept by the SSC and sent to the BVWST DHS. Recommendations from the meeting will be incorporated into the future responses to emergency situations.

## 7.0 Certification

(Note: This page containing the original signatures of the team members will be retained by the SSC and incorporated into the project file copy of the SSP).

By my signature, I certify that:

1. I have read,
2. I understand, and
3. I will abide by

the site safety plan for the LoBue #2 site.

Printed Name	Signature	Date	Affiliation

## Attachment Contents

Attachment A	Personal Protection .....	A-1
Attachment B	Working Environment Action Levels for Site Activities ....	B-1
Attachment C	Breathing Zone Action Levels for Site Activities .....	C-1
Attachment D	Decontamination Stations and Methods .....	D-1
Attachment E	Communication Systems .....	E-1
Attachment F	Work Practices for Temperatures in Excess of 70°F .....	F-1
Attachment G	Work Practices for Temperatures Less Than 40°F .....	G-1
Attachment H	Hazardous Waste Site Personnel Activity Report .....	H-1

## **Attachment A**

### **Personal Protection**

#### **Levels of Protection for Workers**

The specific levels of protection and the necessary components for each have been divided into four categories according to the degrees of protection afforded:

**Level A:** Worn when the highest level of respiratory, skin, and eye protection is needed.

**Note:** No person can work at Level A without special training and written approval by the Director of Health and Safety.

**Level B:** Worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is needed. Level B is the primary level of choice when entering a totally unknown environment.

**Level C:** Worn when the criteria for using air-purifying respirators are met and a lesser level of skin protection is needed.

**Level D:** Worn only as a work uniform and not in any area with respiratory or skin hazards. Level D provides minimal protection against chemical hazards.

#### **Ensembles for the Respective Levels of Protection**

##### **Level B Personal Protective Equipment (PPE):**

- Supplied-air respirator (Occupational Safety and Health Administration/National Institute of Occupational Safety and Health [OSHA/NIOSH] approved). Respirators may be positive pressure-demand, self-contained breathing apparatus, or positive pressure-demand, airline respirator (with escape bottle for immediately dangerous to life or health [IDLH] or potential for IDLH atmosphere).
- Saranex hooded chemical-resistant one-piece suit.
- Long cotton underwear (as applicable).
- Outer gloves, chemical-resistant (Nitrile - 11 mil).
- Inner gloves, chemical-resistant (Nitrile - 4 mil).
- Boots, chemical-resistant, steel toe and steel shank.
- Outer boot covers, chemical-resistant, disposable.
- Hard hat.
- Two-way radio communications (intrinsically safe) or equivalent.

##### **Level C Personal Protective Equipment:**

- Air purifying respirator (OSHA/NIOSH approved) with an organic vapor/acid gas/high efficiency particulate filter cartridge.
- Saranex chemical-resistant one piece suit.
- Outer gloves, chemical-resistant (Nitrile - 11 mil).

- Inner gloves, chemical-resistant (Nitrile - 4 mil).
- Boots, steel toe and steel shank, chemical-resistant.
- Outer boot covers, disposable, chemical-resistant.
- Hard hat.

Level D Personal Protective Equipment:

- Coveralls (tyvek).
- Boots, chemical resistant, steel toe and steel shank.
- Safety glasses with side shields or goggles.
- Hard hat (face shield optional).
- Outer gloves, chemical-resistant (Nitrile-11 mil).
- Inner gloves, chemical-resistant (Nitrile-4 mil).

Attachment B Working Environment Action Levels for Site Activities			
Environment	Instrument	Reading	Action
Organic Vapor Presence	OVA or HNu	Background	Level D
		Above background	Measure breathing zone (see Attachment C)
Oxygen Amount in Air	O <sub>2</sub> Meter (MSA 260)	< 19.5% O <sub>2</sub>	Level B. Explosive meter not valid at <10% O <sub>2</sub>
		19.5%-23% O <sub>2</sub>	SCBA not needed on basis of O <sub>2</sub> content only
		> 23% O <sub>2</sub>	Evacuate. Explosive hazard. Consult with DHS
Explosion/Fire Danger	LEL Meter (MSA 260)	< 5% LEL	Continue activities. Measure breathing zone with OVA or HNu and LEL meter
		5-10% LEL	Identify and eliminate source. Continue activities. Measure breathing zone
		> 10% LEL	Evacuate. Explosion hazard. Consult with DHS
Radioactivity	Minirad Radiation Meter	Background	Continue activities
		Above background	Evacuate. Consult with DHS
Cyanide Gas	Monitox CN Meter	Any indication	Measure breathing zone. Consult with DHS
		No indication	Continue activities
H <sub>2</sub> S Gas	MSTox H <sub>2</sub> S	Any indication	Measure breathing zone. Consult with DHS
Respirable Dust	Mini-Ram Dust Meter	< 2 mg/m <sup>3</sup>	Continue activities
		> 2 mg/m <sup>3</sup>	Measure breathing zone
Noise	Noise Meter	< 85 dB(A)	No hearing protection required
		> 85 dB(A)	Hearing protection required

Attachment C  
Breathing Zone Action Levels for Site Activities

Environment	Instrument	Reading	Action
Organic Vapor Presence	OVA or HNu	< 5 ppm above background	Level C with appropriate cartridges
		5 ppm above background to 500 ppm	Level B
		> 500 ppm	Evacuate. Consult with DHS
Oxygen Amount in Air	O <sub>2</sub> Meter (MSA 260)	< 19.5% O <sub>2</sub>	Level B. Explosive meter not valid of <10% O <sub>2</sub>
		19.5%-23% O <sub>2</sub>	SCBA not needed on basis of O <sub>2</sub> content only
		> 23% O <sub>2</sub>	Evacuate. Explosive hazard. Consult with DHS
Explosion/Fire Danger	LEL Meter (MSA 260)	< 10% LEL	Continue activities
		> 10% LEL	Evacuate. Consult with DHS
Cyanide Gas	Monitor CN Meter	Any indication	Evacuate. Consult with DHS for authorization to re-enter at Level B
Hydrogen Sulfide Gas	MSA 361	No indication	Continue activities
		< 5 ppm	Level D. Monitor breathing zone constantly
		> 5 ppm	Level B
Respirable Dust	Mini-Ram Dust Meter	< 2 mg/m <sup>3</sup>	Continue activities
		2 mg/m <sup>3</sup> to 10 mg/m <sup>3</sup>	Use of respirator with appropriate dust filters
		> 10 mg/m <sup>3</sup>	Evacuate. Consult DHS

Attachment D Decontamination Stations and Methods			
Station	Equipment	Decontamination Methods	Disposal Methods
1	Monitoring Equipment	Wipe with a cloth dampened in a biodegradable detergent solution.	Dispose of cloth in plastic garbage bags in a landfill.
2	Tools, sampling devices, etc.	Wash in a solution of biodegradable detergent and rinse.	Wash water disposed onsite.
3	Boot covers and outer gloves.	Wash and rinse if visibly soiled.	Dispose in plastic garbage bags in a landfill.
4	Tyvek and inner gloves.	Wash and rinse if visibly soiled.	Dispose in plastic garbage bags in a landfill.
5	Respirator	Wash with cleaner-sanitizer solution, rinse, allow to air dry, and place in a plastic bag.	Wash water disposed onsite.
6	Hands and face.	Field wash with soap and water.	Water disposed onsite.
7	Body.	Shower immediately following end of shift.	

Attachment E Communication Systems		
Communication	Signal	Definition
Audible Internal Communications  (whistle, vehicle horn, personal air horn)	One long blast	Evacuate area
	Two short blasts	Localized problem, be on the alert
	Two long blasts	All clear, re-entry permitted
	Three short blasts	Cease work operations
Visual Internal Communications  (hand signals)	Hands clutching throat	Out of air / cannot breathe
	Hands on top of head	Need assistance
	Thumb(s) up	OK / I am all right / I understand
	Thumb(s) down	No / negative
	Arms waving upright	Send backup support
	Grip partners wrist	Exit area immediately
	Cross arms above head	Cease work operations

<p align="center">Attachment F</p> <p align="center">Work Practices For Temperatures in Excess of 70° F</p>
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Where temperatures exceed 70° F, drinking water will be available in the contaminant reduction zone. A closed container with a lever-type flow actuator and disposable cups will be used.

Signs and symptoms of heat stress types are in order of increasing severity:

Type	Symptoms	Treatment
Heat Related Illness	Localized redness of skin and reduced sweating. Reduced tolerance to heat.	Keep skin clean and dry.
Heat Cramps	Muscle spasm and pain in extremities and abdomen.	Remove person to cool area. Give small amounts of salted water.
Heat Exhaustion	Weak pulse; shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; fatigue.	Remove person to cool area, reduce body temperature. Cool by convection. Give small amounts of salted water. Do not allow person to become chilled.
Heat Stroke	Red, hot, dry skin; body temperature of 105° F or greater; nausea; dizziness; confusion; strong rapid pulse; coma. Convulsions may occur.	Seek medical attention immediately. Get victim cool quickly, wrap in wet cloth or immerse in cool water. Fan vigorously during transport to hospital. Apply cold packs, if available, avoiding direct contact between skin and pack/ice.

**Heat stroke** is a life-threatening heat disorder that requires life-saving first aid. Decontamination should be omitted.

**Heat stress** can become life threatening. Unless the victim is grossly contaminated, decontamination should be omitted or minimized and treatment begun immediately.

Heat Stress Monitoring. Heat stress poses a serious health danger to site workers and may create secondary safety hazards by impairing a worker's coordination and judgement. Heat stress can occur at almost any temperature and is more likely when personal protective equipment is in use.

The use of protective equipment may create heat stress. Monitoring of personnel will commence when the adjusted air temperature is 70° F or above. The following table presents the frequency for such monitoring.

Required Frequency of Heat Stress Monitoring		
Adjusted Air Temperature *	Semipermeable Clothing (minutes)	Impermeable Clothing (minutes)
70 - 75	150	120
75 - 80	120	90
80 - 85	90	60
85 - 90	60	30
> 90	45	15

\* Calculate the adjusted air temperature (ta adj) by using the equation:  $ta\ adj = ta\ ^\circ F + (13 \times (\% \div 100) \text{ sunshine})$ . Measure ambient air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent of the time the sun is not covered by clouds that are thick enough to produce a shadow (100% sunshine = no cloud cover and a sharp distinct shadow; 0% sunshine = no shadows).

Monitoring frequency is dependent on the type of protection worn (semi-permeable or impermeable clothing), the dry bulb temperature, and the amount of sunshine. Monitoring frequency should increase as the ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring should be performed by a person with a current first aid certification who is trained to recognize heat stress symptoms. For monitoring the body's response to excess heat, one or more of the following techniques will be used.

- **Heart rate.** Count the radial pulse before site activities and during a 30-second period as early as possible in the monitoring cycle.
  - If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next cycle by one-third and keep the rest period the same.
  - If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following cycle by one-third.
- **Oral temperature.** Use a clinical thermometer (three minutes under the tongue) or similar device to measure the oral temperature before site activities and at the end of the monitoring cycle (before the worker drinks liquid).
  - If oral temperature exceeds 99.6° F (37.6° C), shorten the next work cycle by one-third without changing the rest period.
  - If oral temperature still exceeds 99.6° F (37.6° C) at the beginning of the next rest period, shorten the following cycle by one-third.

- Do not permit a worker to wear a semipermeable or impermeable garment when oral temperature exceeds 100.6° F (38.1° C).

Prevention of Heat Stress. Proper training and prevention measures will aid in averting loss of work production and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion that person may be predisposed to additional heat-related illnesses. To avoid heat stress, the SSHO has the authority to take the following steps.

- Adjust work schedules
  - Modify work/rest schedules according to monitoring requirements.
  - Mandate work slowdowns as needed.
  - Perform work during cooler hours of the day if possible, or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, e.g., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, the workers will be encouraged to drink more. The following strategies may be useful:
  - Maintain water temperature at 50 to 60° F (10 to 16.6° C).
  - Provide dedicated personal bottles or containers that hold about 1 quart of water. Note that dedicated personal bottles of water are for use only in the support zone.
  - Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or diluted drinks) before beginning work.
  - Urge workers to drink a cup or two every 15 to 20 minutes, or at each break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per person per day are recommended, but more may be necessary to maintain body weight.
  - An additional water source should be maintained outside of contamination reduction zone.
- Train workers to recognize the symptoms of heat-related illnesses.
- Source of water should be available to spray down a person as a measure of preventing heat stress.

<p style="text-align: center;">Attachment G Work Practices For Temperatures Less Than 40° F</p>
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Excessive exposure to low environmental air temperatures or immersion in low temperature water are usually fatal unless quickly remedied. Workers must be protected from exposure to cold so that the deep core temperature of the body does not fall below 96.8° F.

Pain in the extremities may be the first early warning of danger to cold stress. Severe shivering may occur if the body temperature drops to 95° F. Workers exhibiting signs of cold stress or hypothermia must get to a warm area until they are safely able to resume their duties.

Summary of American Conference of Governmental Industrial Hygienists Guidelines

When the work environment temperature is less than 40° F, workers will:

- Wear adequate insulating dry clothing to maintain core temperatures above 96.8° F. The outer layer should be wind - and water-proof.
- Remove and replace any clothing that becomes wet.
- Cover hands and head appropriately, at all times.
- Wear mittens for temperatures less than 0° F.
- Avoid contact of metal items with bare flesh.
- Make insulated coveralls or a warm area available during doffing to counter wet undergarments.

In addition to the above described protective measures, the site safety coordinator shall monitor workers for signs of cold stress and hypothermia.

## HAZARDOUS WASTE SITE PERSONNEL ACTIVITY REPORT

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